

Reliance 4

OPC 🖉







Reliance 4

0PC 🖉





and the second

1111

and Alenner

© 2012 GEOVAP, spol. s r.o. All rights reserved.

GEOVAP, spol. s r.o. Cechovo nabrezi 1790 530 03 Pardubice Czech Republic +420 466 024 618 http://www.geovap.cz

Products that are referred to in this document may be trademarks and/or registered trademarks of the respective owners.

While every precaution has been taken in the preparation of this document, GEOVAP, spol. s r.o. assumes no responsibility for errors or omissions, or for damages resulting from the use of information contained in this document or from the use of programs and source code that may accompany it. In no event shall GEOVAP, spol. s r.o. be liable for any loss of profit or any other commercial damage caused or alleged to have been caused directly or indirectly by this document.

Table of Contents

1	What Is OPC?	
1.1	Data Transfer Principle	
1.2	OPC Server Configuration	
2	Reliance and OPC	
2.1	Creating a New Visualization Project	5
2.2	Creating a New OPC Device	
2.3	Connecting a New Device in the Project Structure Manager	
2.4	Adding a Display Component to a Visualization Window	
2.5	Creating a Link to the Display Component	
2.6	Running the Project in a Runtime Software	

1 What Is OPC?

OPC (*OLE for Process Control*) is a standard designed for real-time data exchange between a software application and process control devices such as PLCs. OPC defines an interface independent of the device type. As a result, the end user is almost not limited in the choice of hardware and software for his/her application. The only requirement is OPC compatibility.

There are two kinds of OPC components: OPC client and OPC server.

An **OPC client** is a program that gets (reads) the data from an OPC server for further processing. The typical examples are MMI and SCADA/HMI systems.

An **OPC server** is a program that provides data to OPC clients. It is usually designed to read data from a specific hardware device. An OPC client communicates with an OPC server through a strictly defined interface. As a result, any OPC client can communicate to any OPC server regardless of the type of device for which the server has been created.

The OPC standard is developed by the OPC Foundation organization grouping hundreds of software companies and hardware manufacturers worldwide. New features are continuously added to keep the standard up to date.

A tutorial demonstrating the basic aspects of the OPC standard is available on the website of Matrikon, a renowned OPC product developer company.

1.1 Data Transfer Principle

OPC server is usually a MS Windows application that communicates with a HW device (PLC) via device-specific protocol – server can communicate with HW device e.g. via serial line. Data acquired from HW device is provided via unified interface to other applications – **OPC clients**. OPC standard states, that several OPC clients (even from different companies) can connect to an OPC server concurrently. Most OPC clients (like **Reliance**) can connect to several OPC servers simultaneously.

1.2 OPC Server Configuration

OPC server is usually not provided only by HW device manufacturer, but also by other companies, so several OPC servers can exist for a device. The list of OPC servers for a specific device can be located on the OPC Foundation WWW pages.

After successful installation of an OPC server so called *configuration* have to be *created* and *registered*. To *create* the configuration means to define the list of devices connected to the OPC server, to define parameters of these connections and to define the list of tags (OPC items) that should be read from the device. Configuration have to be saved and *registered*, so it can be loaded immediately after OPC servers starts.

Note: OPC server installation, start and configuration is specific for every OPC server GUI (it is OPC server producer specific).

2 Reliance and OPC

Reliance is a modern *SCADA/HMI* (Supervisory Control And Data Acquisition) system designed for monitoring and controlling industrial processes. One of many features of the **Reliance** system is in-build OPC interface – **Reliance** is an *OPC client*.

The goal of this document is to describe steps required to create a simple visualization project (application) connected to an OPC server.

Creating a New Visualization Project Creating a New OPC Device Connecting New Device in the Project Structure Manager Adding a Display Component to a Visualization Window Creating a Link to the Display Component Running the Project in a Runtime Software

For detailed information about the **Reliance** system, please visit www.reliance.cz.

4

2.1 Creating a New Visualization Project

To create new visualization project, start the development environment *Reliance 4 Design* and select the *File > New Project* command.

•	🖌 Re	liance 4 Design - Project1	
	File	Edit View Managers Project Tools Window He	elp
	*	New Project	J
	2	Open Project Ctrl+O	
Ľ		Restore Project from Backup	ľ
	e,	Close Project	
	*	New Window	
	[New Window Template	
	H	Save Window Ctrl+S	
	Ø	Save All Windows	
	₽,⊳	Close Window Ctrl+F4	
	Q,	Close All Windows	
		1 Project1\Project1.rp4	
		2 College And Antonica State AirCondition.rp4	
		3 Charlester and a start grant with	
		4 Charles Main and Carl and Andrews	
	1	Exit	

File menu

Enter a name of the new project (e.g. OPC) on the *Project name and location* page of the *Create New Project Wizard*. Change the default project directory if it is required and Finish the wizard (on the next pages keep default settings).

Cre	ate New Project Wizard		×				
	Project name and location Choose a name and location for your project.						
	Every visualization project is stored in files organized in a directory structure. One of the files has an '.rp4' extension and is called the main file of a project. Its name is generated based on the name that you enter for your visualization project. The file name can contain only characters 'A''Z', 'a''Z', '0''9' and '_'.						
	Project1	Project1.rp4					
	Choose the directory where your project should	be stored.					
	C:\Pathanadara-Progensi A. april: \						
	Note.: A new folder for the project will be created in the specified directory. The default directory for visualization projects can be configured through the Environment Options dialog.						
	< Back	Next > Car	ncel				

Create New Project Wizard

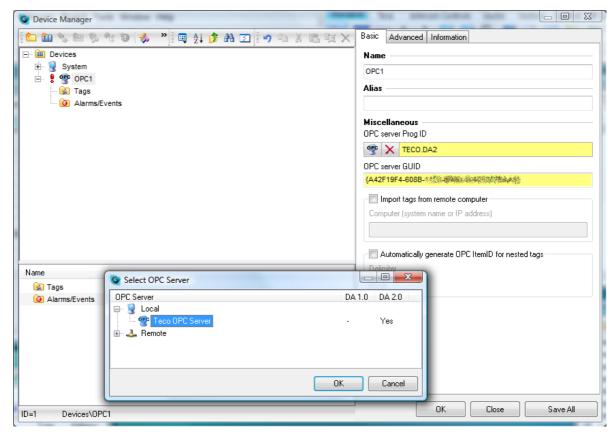
After a new project is successfully created, *Create New Window Wizard* automatically starts to assist in creation of the visualization window. Visualization window contains graphical elements (so called components), which define custom graphical user interface. On the first page of the wizard enter the *Name* and the *Title* of new window (or keep the default settings). Finish the wizard (on following pages keep default settings).

Create New Window Wizard	×
Basic information Enter a name and title for the visualization window.	
Enter a name for the visualization window. The name must be unique within the project.	
Window1	
Enter a title for the visualization window.	
Window1	
< Back Next > Ca	ncel

Create New Window Wizard

2.2 Creating a New OPC Device

Open **Device manager** via *Managers > Device manager*. Add a new OPC device with the *New Device* command (in the Select Device Type dialog window choose OPC). Select the device object in the upper left pane (in the tree) and configure the properties of the OPC device (on the left side of the window). On the *Basic* page define the OPC server identifier (OPC server Prog ID). The identifier can be entered either manually, or selected from the list of OPC servers installed on your system (after clicking the OPC icon).



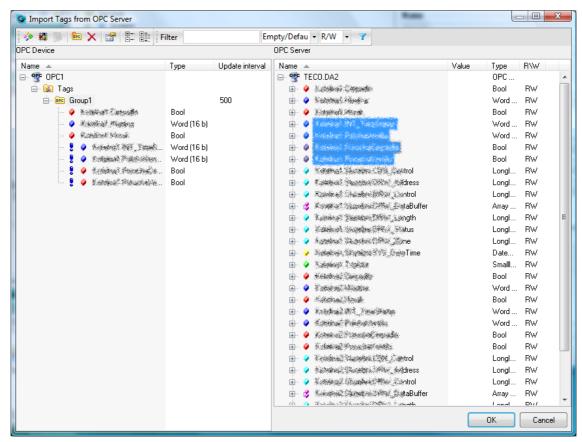
Device Manager – Select OPC server dialog

In the tree select the *Tags* folder of the OPC1 device. Create a new OPC group via the *New OPC Group* command (from toolbar or local menu). You can change its name for example to OPC. Select the newly created folder object and via the *Import from OPC Server* command import tags (*OPC Items*) from the OPC server – installed OPC server should automatically start to provide the list of tags defined in its configuration.

	0 🕺 🇞 📗	💷 🛃 🦻 🖓 🖸 🔄 👘 👗 🛍	👔 🗙 Basic Information			
- 🔟 Devices		*	Name			
🖻 🐨 OPC1			Group1			
🖃 😡 Tags			· · ·			
🖃 🎆 Group1			Alias			
	5 (300 a) 7 0					
	e 4 Seland Brue		Export and import in CSV format			
	et. Heave		Export and import in CSY format			
	indexes and a second		Export Export (Unicode)	Import		
	antari Parahatrik					
	nta: Phone Anda		Import of tags			
	aliseit Persectiation	\$5\$\$\$				
Alarms/Events			Import from OPC Server	r		
표 😼 System						
			Import from UPU LSV	Import from OPC CSV		
			Export to OPC CSV			
			Export to OPC CSV			
			Export to OPC CSV			
Name	Туре	Address	OPC group properties	ead hand (%)		
Name 🔗 Mostine' Campaign	Type Bool	Address	OPC group properties Update interval (ms) De	ead band (%)		
			OPC group properties			
 Honaline 1 Carrupola Honaline 1 Medima Honaline 1 Medima Honaline 1 Medima 	Bool	Rochentra V. Cantonaldia. Rochentra I. Marathua. Rochandra V. Anarona.	OPC group properties Update interval (ms) De			
 Konstinel Carpoldo Kotarna - Mardina Kotarna - Mardina Kotarna - Marai Poteina - Marai 	Bool Word (16	Zarahia", Carpadh Robrian Madou Bahabar Anna Pabunai Mirina Pabunai Miri, Somejana	OPC group properties Update interval (ms) De			
 Kozelne J. Cerupelin Kozelne J. Kepeline Kozelne J. Kozel Robelne J. Kozel Robelne J. Kozel Kozelne J. Kozel 	Bool Word (16 Bool	Richelton Carponisti Roheitopi Olaadine Koheitopi Ausone Richeltopi Mir, Sonnastanopi Hahadhat Mir, Sonnastanopi	OPC group properties Update interval (ms) De 500 V			
 Koteline J. Cercupido Koteline J. Sequence Koteline J. State Koteline J. State Robeline J. Michaeline Koteline J. Michaeline Koteline J. Processer 	Bool Word (16 Bool Word (16	Rostation, Connactia Rostaniae Okazinae Rostaniae Anora Rostaniae M., Samasianaa Natainae M., Samasianaa Natainae Montae randomonatae Rostaniae Provider Jacobae	OPC group state			
 Honeline J. Caropedia Kolesta L. Reports Kolesta L. Norse Kolesta L. Norse Poteka L. M. J. Toresi Kolesta J. Norseaucen 	Bool Word (16 Bool Word (16 Word (16	Richelton Carponisti Roheiton Olaabiya Katabiya Marya Paraina Ni Mir, Taimadanay Tainahat Mir, Taimadanay	OPC group properties Update interval (ms) De 500 OPC group state Inactive Active			
 Kotsens - Markina Kotsens - Markina Kotsens - Markina Robert - MA, Tango - Markina Kotsens - Markina Kotsens - Normalian - Markina 	Bool Word (16 Bool Word (16 Word (16 Bool	Rostation, Canpadia Rostainas Okadinas Rostainas Anora Rostainas Ant, Sainasilanas Naturnas Antonicas Rostainas Posicias revolus Rostainas Posicias Concentias	OPC group state OPC group state Indextorial interval (ms) OPC group state Indextorial interval			
 Kozelne J. Ceropelia Kozelne J. Separte Kozelne J. State 	Bool Word (16 Bool Word (16 Word (16 Bool	Rostation, Canpadia Rostainas Okadinas Rostainas Anora Rostainas Ant, Sainasilanas Naturnas Antonicas Rostainas Posicias revolus Rostainas Posicias Concentias	OPC group properties Update interval (ms) De 500 OPC group state Inactive Active			
 Hondine J. Campelita Koldenia J. Separate Koldenia J. Standa Koldenia J. Standa Hoteka J. Marka Hoteka J. Marka Koldenia J. Marka Koldenia J. Marka 	Bool Word (16 Bool Word (16 Word (16 Bool	Rostation, Canpadia Rostainas Okadinas Rostainas Anora Rostainas Ant, Sainasilanas Naturnas Antonicas Rostainas Posicias revolus Rostainas Posicias Concentias	OPC group properties Update interval (ms) De 500 OPC group state Inactive Active			

OPC group properties

The *Import Tags from OPC server* dialog window is divided into a left pane with **Reliance** defined objects and the right pane with **OPC server** defined objects. Drag and drop objects from right to left pane with a mouse to import the tags form the OPC server.



Import Tags from OPC Server dialog

2.3 Connecting a New Device in the Project Structure Manager

Each object that should be accessed on runtime have to be connected to a computer first. Connecting an object to a computer means to add an object to a specific folder in the *Project Structure Manager* under required computer (configuration). After the changes made in the *Device Manager* are saved, the user is asked if newly created object should be connected to the computer. If Yes is chosen, *Project Structure Manager* is **automatically** opened and OPC device is added to the *Devices* folder under the *PC1* computer. If *No* is chosen, object is not connected to any computer and it have to be connected later manually.

Before a device is connected, first open the *Project Structure Manager (Managers > Project Structure Manager)* and in the left pane (the tree) select the *Devices* folder. To **manually** connect a device to a computer chose the *Connect Devices* command from the local menu (or *Connect Objects* from toolbar).

Project Structure Manager	
🖆 ڻ 🮲 😫 💷 XI 🤌 ሕ 🖃 🖕 🔏 🖺 🏹	Basic MEM file Information
Control Areas Control Areas PC1 PC1 Channel1 Custom Reports Custom Repor	Inclusion Image: Channel choice Automatic Tag-controlled (Index) Index Status Status Channel list Image: Channel1
S Channel1	
ID=1 Control Areas\Control Area1\PC1\Devices\OPC1	OK Close Save All

Project Structure Manager

Select	Device	-		x
1 🏚 🍫	* 📿	View 👻	Manager	
OPC1				
Item list				
💖 OPC1				
1				
		ĸ	Cancel	

In the Select Device dialog window chose OPC1 device and confirm.

Select Device dialog

Close Project Structure Manager with the OK button to save the changes.

2.4 Adding a Display Component to a Visualization Window

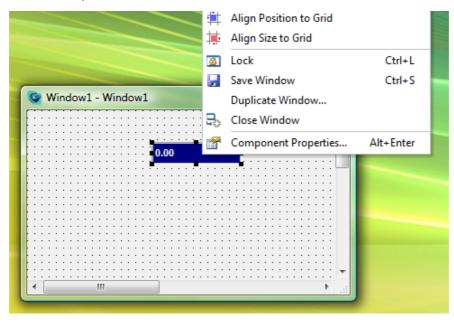
The *Display* component is located in the component palette (to the right from the main menu) on the *Standard* tab. Select the *Display* component in the component palette and click into the visualization window area to add the component.

indow H	Help			Standard	Teco Johns	on Controls	Sauter Vectors
💐 🧻	di 🙋 🗎 🗎) 📙 🞜	: 🖻 🤡 😫	2,3	📧 А 🐴	ı 📰 🔚 🤅	\lambda 👕 🗉 🛽
÷ +			🗰 🐺 🙆		ter 🔜 🗳	9 9 (13)	臣してで一家
			in the second second second second				
😪 Wind	dow1 - Window1						
🤡 Wind	low1 - Window1						_ C X
😵 Wind	dow1 - Window1						_ D _ X
🔮 Wind							
	0.00			· · · · · · · · · · · · · · · · ·			
	0.00			· · · · · · · · · · · · · · · · ·			
· · · · · · · · · · · · · · · · · · ·	0.00			· · · · · · · · · · · · · · · · ·			
	0.00			· · · · · · · · · · · · · · · · ·			

Adding the Display component to a visualization window

2.5 Creating a Link to the Display Component

Newly added display component have to be linked to a tag to show a value. Open the *Display Properties* dialog (e.g. double click on the component or select the command from the component's *Local menu*).



Component's Local Menu

On the *Functions* tab enter tag's full name in the *Link* to tag field. Tag name can be also selected via Select Tag dialog (dialog is shown after the icon on the left is clicked).

Display - Properties							×
Basic Alignment D	Dynamic Menu	Scripts/Actions	Security	Functions	Static	Eng. units	
Link to tag							
🤣 🗙							
Test value	0.00						
Limits							
- 🔲 High warnin	g		E H	ligh critica	I		
Value	Color			Value	Co	olor	
Background	Color			Background	Co	olor	
Low warning	9		- 🗖 L	ow critical			
Value	Color			Value	Co	olor	
Background	Color			Background	Co	olor	
			0	K 🔤	Cancel	Ap	ply

Display Properties

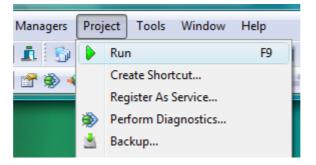
In the dialog window select the tag imported from the OPC server (see chapter Creating a new OPC device) and confirm the dialog with the *OK* button.

Select Tag			×
🍺 🍫 🔭 🔀 View 🗸	Manager 🤇	•	
Kotelna1.Cerpadlo			•
Tag	Туре	Address	
🔌 Altona i Tarpatio	Bool	Addated Company.	
 Mathematics Mathematics 	Word (16 b)	Artesta States	
	Bool	Mahampo Kalopa	
		ОК	Cancel
ID=1 OPC1\Group1\# comments	E ana ana ana ana ana ana ana ana ana an		

Select Tag dialog

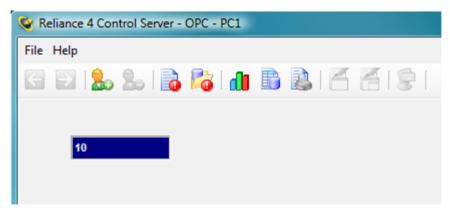
2.6 Running the Project in a Runtime Software

To start the project in the *runtime software* select the > Project > Start command from the main menu (or press F9). The type of started *runtime software* depends on the licence and on the settings in the *Project* > *Options* > *Runtime* (View, Control or Control Server).



Starting the runtime software

The display component shows the real-time value of the OPC tag.



Tag value displayed in the Display